

Amendment and Listing of the Claims

This listing of claims will replace all prior versions of claims and listings of claims in the application:

1. (currently amended) A liquid distillation system comprising:
 - a) an input for receiving untreated input liquid;
 - b) ~~a vaporizer an evaporator~~ an evaporative condenser coupled to the input for transforming the liquid to vapor and for transforming compressed vapor into a distilled liquid product;
 - c) a head chamber for collecting vapor from the ~~vaporizer evaporator~~; evaporative condenser;
 - d) a vapor pump for compressing the vapor, the vapor pump in communication with the evaporative condenser and comprising:
 - i. an a single continuous internal drive shaft; and
 - ii. at least one intake for axial feeding; and
 - iii. an eccentric rotor with a fully rotatable housing, the rotatable housing supported by a rotatable housing shaft. -and
 - e) ~~a condenser in communication with the vapor pump for transforming compressed vapor into a distilled liquid product; and~~
 - f) ~~a feedback control loop comprising level sensors and variable flow valves for controlling fluid flow and maintaining fluid levels in the system at near constant levels.~~
2. (currently amended) The liquid distillation system as in claim 1 wherein the rotor further comprises a multiplicity of vanes separated by chambers, each chamber having ~~an intake and an~~ exit.
3. (original) A liquid distillation system according to claim 1 wherein the input is coupled to at least one heat source.
4. (currently amended) A liquid distillation system according to claim 1 further comprising a sump wherein liquid from the ~~evaporator~~ evaporative condenser may be preheated at start-up.

5. (currently amended) A liquid distillation system according to claim 4 wherein the ~~evaporator~~ evaporative condenser has a plurality of parallel core evaporator tubes, each tube having a first open end in communication with the sump and a second open end in communication with the head chamber.

Claims 6-7 (canceled)

8. (currently amended) A liquid distillation system according to claim 1 further comprising an output for collection of distilled liquid product, ~~and further in connection with the input for recycling a blowdown stream.~~

Claims 9-11 (canceled)

12. (previously amended) A liquid distillation system according to claim 1, the system further comprising a switch selected from the group consisting of a thermostatic switch, a pressure-sensing switch, a thermal transducer and a pressure transducer, for signaling completion of the heating phase and turning off the heating unit.

13. (original) A liquid distillation system according to claim 1 further comprising a heat exchanger for receiving liquid from the input such that heat from at least one source is exchanged with the input liquid.

14. (canceled)

15. (original) A liquid distillation system according to claim 13 wherein the heat exchanger is a multi-line exchanger for exchanging heat from a number of sources with the input liquid.

Claims 16-17 (canceled)

18. (currently amended) A liquid distillation system according to claim 1, the system further comprising a multi-unit filter having at least two units in the input for filtering the liquid before the liquid is received by the ~~evaporator~~ evaporative condenser.

19. (original) A liquid distillation system according to claim 18 wherein the filter is a flip-filter.

20. (previously amended) A liquid distillation system according to claim 19, the system further comprising a mechanism for periodically rotating the flip-filter for back-washing filter units to prevent fouling.

Claims 21-23 (canceled)

24. (original) A liquid distillation system according to claim 1 further comprising a power source coupled to the system wherein the power source is a clean-burning generator.

25. (currently amended) A liquid distillation system comprising:

- a) an input for receiving untreated liquid;
- b) an ~~evaporator~~ evaporative condenser coupled to the input for transforming the liquid to vapor and for transforming compressed vapor into a distilled liquid product;
- c) a head chamber for collecting vapor from the evaporator;
- d) a vapor pump for compressing the vapor, the vapor pump in communication with the evaporative condenser and comprising:
 - 1. an internal drive shaft; and
 - 2. an eccentric motor; and
- ~~e) a condenser for transforming compressed vapor from the vapor pump into a distilled liquid product;~~
- f e) a multi-unit filter having at least two filter units in the input for filtering liquid before it is received by the evaporator ~~;~~ and
- ~~g) a feedback control loop comprising level sensors and variable volume flow valves for controlling fluid flow and maintaining fluid levels in the system at near constant levels.~~

26. (original) A liquid distillation system according to claim 25 further comprising a diverter whereby at least one filter unit is back-washed by a blowdown stream diverted from the head chamber.
27. (original) A liquid distillation system according to claim 26 further comprising a regulator coupled to the diverter for providing the minimum flow rate blowdown stream from the head chamber necessary to back-wash the at least one filter unit.
28. (original) A liquid distillation system according to claim 26 wherein the multi-unit filter is a flip-filter.
29. (original) A liquid distillation system according to claim 28 further comprising a mechanism for periodically rotating the flip-filter at appropriate intervals to prevent fouling.
30. (previously amended) A liquid distillation system according to claim 25 further comprising a heat exchanger for receiving input liquid such that heat from at least one of a plurality of sources is added to the input liquid.
31. (previously amended) A liquid distillation system according to claim 30 wherein the at least one of a plurality of heat sources is selected from the group consisting of a product stream, a blowdown stream, system waste heat, vapor pump waste heat, motor waste heat, exhaust heat from a power source, and an external heat source.
32. (previously amended) A liquid distillation system according to claim 30 wherein the heat exchanger is a multi-line heat exchanger for exchanging heat with the input liquid.

Claims 33 - 35 (canceled)

36. (currently amended) A method for distilling a liquid comprising:
 - a. evaporating untreated input liquid in an ~~evaporator~~ evaporative condenser to form a vapor to fill a head chamber;
 - b. collecting the vapor from the evaporative condenser in the head chamber;
 - ~~b.~~ c. compressing the vapor by rotating the vapor in the a vapor pump having at least one intake for axial feeding and using a an continuous internal drive shaft and eccentric rotor with a fully rotatable housing supported by rotatable housing shaft to produce compressed vapor; and

~~e. d.~~ condensing the compressed vapor in ~~a condenser~~ the evaporative condenser
having an internal pressure into a distilled liquid product, ~~and~~
~~d. controlling fluid flow and maintaining fluid levels in the system at near constant~~
~~levels using a feedback control loop comprising level sensors and variable flow valves.~~

Claims 37-48 (canceled)

49. (original) A method of distilling a liquid according to claim 36, further comprising coupling a clean-burning generator to the system.

Claims 50-52 (canceled)

53. (original) A method of distilling a liquid according to claim 36, further comprising eliminating entrained liquid droplets from the vapor in the vapor pump.

Claims 54-92 (canceled)

93. (previously amended) A method of distilling a liquid according to claim 36, further comprising:
measuring total dissolved solid in a blowdown stream from vaporized untreated liquid;
and
adjusting a source feed rate of the untreated liquid if the total dissolved solid is above a prescribed level.

Claims 94-102 (canceled)